## In the Title of the Invention:

Please amend the title to read:

--DEVELOPER SUPPLY CONTAINER <u>DETACHABLY MOUNTABLE TO IMAGE</u>
FORMING APPARATUS DETECTING THE AMOUNT OF DEVELOPER REMAINING IN
THE CONTAINER--

## In the Specification:

Please amend the paragraph starting at page 1, line 15 and ending at line 22 as follows.

In such a conventional developer supply container, as means for detecting optically [[a]] the remaining amount of developer therein, detection means, including two light guide means disposed opposite to each other on a side surface of the developer supply container, has been used (e.g., Japanese Laid-Open Patent Application (JP-A) Hie 10-171232 (pages 1 - 11, Figures 2 and )).

Please amend the paragraph starting at page 1, line 27 and ending at page 2, line 4 as follows.

According to these detection means, in the case where there is developer, an optical pass path is cut off by the developer and when the developer is decreased in amount, a light receiving sensor can detect light.

Please amend the paragraph starting at page 2, line 5 and ending at line 7 as follows.

However, the conventional developer supply containers have <u>been</u> accompanied with <u>by</u> the following problems.

Please amend the paragraph starting at page 2, line 8 and ending at line 20 as follows.

In the case of using the detection means as described in JP-A Hei 10-171232, the two light guide means consisting of different members are used, so that [[a]] the production cost is liable to be increased. Further, in keeping with the current trend, a main assembly of the image forming apparatus is also liable to be compact, so that a developing apparatus per se is also required to be compact. In such a case, the developer supply container is inevitably required to be compact. Accordingly, in some cases, it is impossible to use the two light guide means each disposed on the side surface of the developer supply container as in JP-A Hei 10-171232.

Please amend the paragraph starting at page 2, line 21 and ending at line 24 as follows.

As means for solving such a problem of <u>the</u> placement space of the detection means as in JP-A Hei 10-171232, it is possible to use the toner end detection means as described in JP-A Hei 11-38755.

Please amend the paragraph starting at page 3, line 12 and ending at line 21 as follows.

However, in the case where the toner cartridge described in JP-A Hei 11-38755 is mounted in a rotation type developing apparatus, the developer [[is]] does not necessarily remaining remain in the vicinity of the toner end detection means. Accordingly, there is a possibility that the developer is detection means erroneously detected as detects the absence of developer, although there is still sufficient amount of developer and therefore the toner cartridge containing a large remaining amount of developer is subjected to replacement.

Please amend the paragraph starting at page 4, line 26 and ending at page 5, line 1 as follows.

Figure 1 is a <u>schematic</u> sectional view of an image forming apparatus including the developer supply container according to the present invention.

Please amend the paragraph starting at page 5, line 2 and ending at line 4 as follows.

Figures 2 and 3 are respectively a <u>different</u> perspective <u>view views</u> of the developer supply container of the present invention.

Please amend the paragraph starting at page 5, line 5 and ending at line 6 as follows.

Figure 4 is a partially partial perspective view of the inside of the developer supply container.

Please amend the paragraph starting at page 5, line 9 and ending at line 11 as follows.

Figure 6 is a <u>schematic</u> view illustrating a <u>developer</u> state of <u>developer</u> in a less remaining amount in the <u>developer supply container</u> in which less developer is present than when the <u>container</u> is full.

Please amend the paragraph starting at page 5, line 12 and ending at line 14 as follows.

Figures 7 and 8 are respectively a view different perspective views illustrating a flow of developer in the vicinity of discharge opening of the developer supply container.

Please amend the paragraph starting at page 5, line 15 and ending at line 20 as follows. Figures 9(a), 9(b) and 9(c) 9(A), 9(B) and 9(C) are schematic views each showing [[a]] the positional relationship between a discharge opening and light guide means in Embodiments 1 to 4 (Figure 9(A)), Comparative Embodiments 1 to 3 are shown in [[(]] Figure 9(B), and Modified Embodiments Embodiments of the developer supply container are shown in Figure Figures 9(A) and (Figure 9(C) [[)]].

Please amend the paragraph starting at page 5, line 21 and ending at line 23 as follows. Figure 10 is a <u>schematic perspective</u> view showing an upper portion of the developer supply container of the present invention.

Please amend the paragraph starting at page 5, line 24 and ending at line 26 as follows. Figure 11 is a partially partial perspective view of the developer supply container of the present invention.

Please amend the paragraph starting at page 5, line 27 and ending at page 6, line 2 as follows.

Figures 12 and 13 are respectively a view <u>different perspective views</u> showing light guide means used in the developer supply container of the present invention.

Please amend the paragraph starting at page 6, line 3 and ending at line 4 as follows.

Figure 14 is a <u>schematic</u> view illustrating a detection method [[f]] <u>of detecting</u> a remaining amount of developer.

Please amend the paragraph starting at page 6, line 5 and ending at line 7 as follows.

Figure 15 is a diagram table showing data of the remaining amount of developer in Embodiments 1 to 4 and Comparative Embodiments 1 to 3.

Please amend the paragraph starting at page 6, line 8 and ending at line 12 as follows.

Figures 16(a), 16(B) and 16(C) [[re]] are schematic views each showing a positional relationship between [[a]] the discharge opening and a developer detection area in EMbodiment Embodiment 5 (Figure 16(A)), EMbodiment Embodiment 6 (Figure 16(B)), and Comparative Embodiment 5 (Figure 16(C)).

Please amend the paragraph starting at page 6, line 13 and ending at line 15 as follows. Figures 17(A) and 17(B) are respectively a view different schematic views of the developer supply container of the present invention.

Please amend the paragraph starting at page 6, line 16 and ending at line 18 as follows.

Figure 18 is a diagram table showing data of the remaining amount of developer in

Embodiments 5 and 6 and Comparative Embodiment 5.

Please amend the paragraph starting at page 6, line 19 and ending at line 22 as follows.

Figures 19 and 20 are respectively a partially different partial perspective view views of the inside of the developer supply container according to another embodiment of the present invention.

Please amend the paragraph starting at page 6, line 25 and ending at page 7, line 10 as follows.

Hereinbelow, preferred embodiments of the developer supply container according to the present invention will be described with reference to the drawings. In the following description, dimensions, materials, shapes and relative arrangements of structural parts or members are illustrative and may appropriately be modified depending on structures and various conditions of the apparatus to which the developer supply container of the present invention is applicable. Accordingly, it should not be understood that the scope of the present invention is not limited to those in the following description unless otherwise specified.

Please amend the paragraph starting at page 7, line 20 and ending at page 8, line 21 as follows.

Referring to Figure 1, in an image forming portion comprising a photosensitive drum 104, etc., an electrostatic latent image is formed on the photosensitive drum 104 by an optical unit 103 on the basis of image data read from an original 101 set on an original supporting problem platen glass 102 or image data sent from another piece of equipment. On the other hand, a recording medium P such as sheets of paper, OHP sheets, etc., stacked in paper supply cassettes 105 and 106 is selectively fed by feeding rollers, one of which is denoted as 105A and 106A, on the basis of information inputted from an operating unit (not shown) by an operator. A single recording medium P fed from the paper supply cassette is conveyed to registration rollers 110 by way of a feeding portion 109, and is fed to the photosensitive drum 104 by the registration rollers 110 by

synchronizing the rotation of the photosensitive drum 104 and the scanning timing of the optical unit 103. A toner image formed on the photosensitive drum 104 by a developing apparatus is transferred onto the recording medium P by transfer means 111. Thereafter, the recording medium P is separated from the photosensitive drum 104 by separation means 112, and is conveyed to a fixing portion 114 by a feeding portion 113. In the fixing portion 114, the toner image on the recording medium P is fixed by heat and pressure. After the fixation, the recording medium P is discharged to a sheet discharge tray 117 by sheet discharging rollers 116.

Please amend the paragraph starting at page 10, line 1 and ending at line 12 as follows.

The developer supply container used in this embodiment will be described with reference to the drawings. Figure Figures 2 and 3 are perspective views of the developer supply container used in this embodiment, and Figures 4 and 5 are perspective views each showing the inside of the developer supply container. Figure 6 is a view illustrating a state of a less diminished amount of developer in the developer supply container. Figures 7 and 8 illustrate [[a]] the flow of developer in the vicinity of a discharge opening of the developer supply container. Figures 12 and 13 illustrate light guide means (members) 20.

Please amend the paragraph starting at page 10, line 27 and ending at page 11, line 18 as follows.

Further, at an inner surface of the developer supply container 1, feeding means 14 for feeding the developer in the container body 1C and discharging the developer from the discharge opening 10. At an inner surface of the container body 1C (the lower container portion 1B), the feeding means 14 has feeding projections 12 for stirring and feeding the developer in the container body 1C (the lower container portion 1B) toward the discharge opening 10 and a pair of plate-like projections 11 disposed as a pair of guide means so that they are closer to each other toward the downstream direction with respect to movement of the developer. The pair of

plate-like projections 11 are disposed at an inner peripheral surface of the container body lC (the lower container portion 1B) so as to be opposite to each other through the discharge opening 10, i.e., so as to interpose the discharge opening 10 therebetween, in a longitudinal direction of the developer supply container.

Please amend the paragraph starting at page 11, line 19 and ending at page 12, line 13 as follows.

In the vicinity of an area in which the developer is guided and collected by the pair of the pair of plate-like projections 11, light guide means (member) 20 as a detection member (light transmissive member) for detecting a remaining amount of developer is provided. The light guide means 20 includes a first light guide means (member) 20A for permitting transmission or reflection of light emitted from a light emitting element 40 disposed on the main assembly side of the image forming apparatus to which the developer supply container 1 is detachably mounted and a second light guide means (member) 20B for permitting transmission or reflection of light which has passed through the inside of the container body 1C via the first light guide means 20A so as to guide the light to a light receiving element 41 disposed on the main assembly side of the image forming apparatus. In this embodiment, the first and second light guide means (members) 20A [[an]] and 20B constituting the light guide means 20 are adhered or melt-bonded to the upper container portion 1A side constituting the container body 1C.

Please amend the paragraph starting at page 13, line 17 and ending at page 14, line 12 as follows.

Figure 14 simply illustrates a mechanism for detecting the remaining amount of developer. Light emitted from the light-emitting element 40 disposed on the image forming apparatus main assembly side passes through the first light guide means 20A and moves toward the second light guide means 20B. At that time, in the case where the developer is present in an

optical (light) path between the first and second light guide means 20A and 20B, the light receiving portion (element) 41 disposed on the image forming apparatus main assembly side cannot detect the light since the light is blocked by the developer. On the other hand, in such a state that the developer is substantially absent in the optical path between the first and second light guide means 20A and 20B, the light is not blocked in the optical path, so that the light passed through the first light guide means 20A can reach and pass through the second light guide means 20B. As a result, the light receiving portion (element) 41 can detect the light. At the time when the light is detected in the above-described manner, judgment a determination that the developer is substantially absent is made.

Please amend the paragraph starting at page 14, line 13 and ending at line 18 as follows.

As described above, the light guide means as the detection member permits light transmission from the light emitting portion [[41]] 40 at the time of detection of the remaining amount of developer in the container, thus being not means (member) for actually detecting the developer remaining amount.

Please amend the paragraph starting at page 15, line 7 and ending at line 17 as follows.

As a result, it is unnecessary to effect detection of the absence of developer until the remaining amount of developer becomes slight small, i.e., it becomes possible to effect detection of the absence of developer only after the remaining amount of developer becomes slight small. Accordingly, it is possible to effect detection of the absence of developer in such a state that the developer in the developer supply container is substantially used up, so that it becomes possible to provide [[the]] a developer supply container 1 containing less remaining that can be used until only a small amount of developer remains.

Please amend the paragraph starting at page 15, line 23 and ending at page 16, line 8 as follows.

More specifically, in the present invention, the vicinity of the area in which the developer collected by the pair of plate-like projections means is the area in which the developer is collected by the pair of plate-like projections or an area on the same peripheral surface including such an area of the inner surface of the container. The position of the detection area 20 can be appropriately selected in the peripheral direction (rotation direction) of the developer supply container from the view point of, e.g., the rotation mode (stop position) of the rotation member 30, so long as it is on the same peripheral surface.

Please amend the paragraph starting at page 16, line 9 and ending at line 17 as follows.

As described above, according to this embodiment, detection of the remaining amount of developer is effected in the vicinity of the area in which the developer is collected by the pair of plate-like projections 11 under rotation of the container, whereby it is possible to inexpensively detect the absence of developer only after the developer is placed in a less amount state substantially used up in the developer supply container, without causing error detection.

Please amend the paragraph starting at page 17, line 3 and ending at line 11 as follows.

Further, at least a part of the detection area 20C of the light guide means 20 overlaps the discharge opening as seen in a direction perpendicular to the longitudinal direction (rotation axis direction) (e.g., [[a]] as shown in Figure 9 (A)), so that it is possible to delay remaining amount detection timing for the absence of developer. As a result, an amount of developer remaining in the developer supply container after use can be reduced as small as possible.

Please amend the paragraph starting at page 17, line 12 and ending at line 26 as follows.

Further, as described above, the light guide means 20 is provided with [[an]] the inclined surface 20x, which is inclined with respect to [[a]] the mounting surface 20z, for reflecting light and [[a]] the vertical surface 20y which is substantially perpendicular to the mounting surface 20z, for permitting light transmission; and the first and second light guide means 20A and 20B are disposed opposite to each other in the rotation axis direction of the container at the inner surface of the container body 1C (the upper container portion 1(A). As a result, the developer fed by the pair of plate-like projections 11 toward an upstream side in the container rotation direction is liable to flow between the first and second light guide means 20A and 20B, thus being further improved in detection accuracy.

Please amend the paragraph starting at page 18, line 1 and ending at line 10 as follows.

In this comparative embodiment, measurement of <u>the</u> remaining amount of developer at the time of effecting detection of <u>the</u> absence of developer was performed by using a comparative developer supply container shown in Figure 9(B), as a comparative embodiment for the above described developer supply container (Figure 9(A)) of Embodiment 1. [[An]] <u>The</u> (initial) amount of developer <u>to be</u> used [[in]] <u>is</u> 180 g for the comparative developer supply container and a measurement result is shown in Figure 15.

Please amend the paragraph starting at page 18, line 21 and ending at line 23 as follows.

As shown in Figure 15, a remaining amount of developer at the time of detection of <u>the</u> absence of developer was about 70 - 80 g (COMP. 1-1).

Please amend the paragraph starting at page 19, line 4 and ending at line 14 as follows.

As shown in Figure [[0]] 9(C), the light guide means 20 is located in the upper container portion, not in the lower container portion as in Embodiment 1 (Figure 9(A), so that a developer

remaining amount at the time of detection of absence of developer was about 30 - 40 g (EMB. 1-2) as shown in Figure 15. Accordingly, in order to further reduce the developer remaining amount, it is preferable that the light guide means 20 is disposed in the lower container portion of the developer supply container as shown in Figure 9(A).

Please amend the paragraph starting at page 19, line 15 and ending at line 20 as follows.

Compared with these Comparative and Modified Embodiments 1, a developer remaining amount at the time of detection of the absence of developer in the developer supply container shown in Figure 9(A) (Embodiment 1) was about 8 - 10 g (EMB. 1) as shown in Figure 15.

Please amend the paragraph starting at page 19, line 21 and ending at page 20, line 3 as follows.

As is understood from these results (Figure 15), according to Embodiment 1, the developer is collected close to the light guide means 20 by the pair of plate-like projections 11 with rotation of the container body, so that it is possible to effect detection of no developer with an inexpensive structure and no error detection only after the developer is placed in a less amount state in which the developer is substantially used up. As a result, the developer supply container can be substantially used up.

Please amend the paragraph starting at page 20, line 15 and ending at line 27 as follows.

The developer fed by the feeding projections (plate-like projections) 11 and 12 after having passed through the discharge opening 10 is more liable to be collected in an area 16 surrounded by the L-shaped charge projection 13. Further, even in the case where the developer developer, which has been once discharged from the opening 10, is returned into the developer supply container 1 when the discharge opening 10, is directed upward by rotation of the developer supply container 1, it is possible to prevent diffusion of the developer in the developer

supply container 1 by the projection 13. Accordingly, [[a]] detection accuracy is further improved.

Please amend the paragraph starting at page 21, line 19 and ending at page 22, line 2 as follows.

In this comparative embodiment, measurement of remaining amount of developer at the time of effecting detection of absence of developer was performed by using a comparative developer supply container shown in Figure 9(B) provided with the above-mentioned L-shaped projection 13 (not shown), as a comparative embodiment for the above described developer supply container (Figure 9(A) of Embodiment 2. [[An]] The amount of developer to be used [[in]] is 180 g for the comparative developer supply container and a measurement result is shown in Figure 15.

Please amend the paragraph starting at page 22, line 11 and ending at line 21 as follows.

As shown in Figure [[0]] <u>9</u>(C), the light guide means 20 is located in the upper container portion, not in the lower container portion as in Embodiment 2 (Figure 9(A)), so that a developer remaining amount at the time of detection of absence of developer was about 20 - 30 g (EMB. 2-2) as shown in Figure 15. Accordingly, in order to further reduce the developer remaining amount, it is preferable that the light guide means 20 is disposed in the lower container portion of the developer supply container as shown in Figure 9(A).

Please amend the paragraph starting at page 22, line 22 and ending at line 27 as follows.

Compared with these Comparative and Modified Embodiments 2, [[a]] the developer remaining amount at the time of detection of the absence of developer in the developer supply container shown in Figure 9(A) (Embodiment 2) was about 4 - 6 g (EMB. 2) as shown in Figure 15.

Please amend the paragraph starting at page 23, line 17 and ending at line 22 as follows.

In this embodiment, as the developer, a two component type developer comprising toner and a carrier. As the carrier, magnetic carrier particles are uniformly mixed in the developer in an amount of 5 - 3 [[wt.]] weight % (specifically, 30 g per 210 g developer in this embodiment).

Please amend the paragraph starting at page 24, line 4 and ending at line 12 as follows.

If the mixing amount of the magnetic carrier particles in the developer is smaller than 5

[[wt.]] weight %, the above-described toner attachment amount-reducing effect is lowered, and if the mixing amount is larger than 30 [[wt.]] weight %, a risk of damaging the light guide means is

increased rather than the toner attachment amount-reducing effect. Further, [[a]] the cost as a kit

including the developer supply container and the developer is increased.

Please amend the paragraph starting at page 24, line 20 and ending at page 25, line 1 as follows.

Incidentally, in the case where the light guide means is formed of a resin, a magnetic material dispersion type carrier having a resin-coated surface reduces [[a]] the possibility of damaging the surface of the light guide means 20 rather than a metal carrier, such as ferrite carrier, since both of the light guide means and the carrier have a resinous surface. As a result, the number of times the developer supply container is used is increased.

Please amend the paragraph starting at page 25, line 3 and ending at line 19 as follows.

In this comparative embodiment, measurement of the remaining amount of developer at the time of effecting detection of the absence of developer was performed by using comparative developer supply containers, shown in Figure 9(B), each containing the above-described two component type developer used in Embodiment 4, as a comparative embodiment for the above described developer supply containers (Figure 9(A)) of Embodiments 1 and 2. Further, as a

modified embodiment for Embodiments 1 and 2, modified developer supply containers, shown in Figure 9(C), each containing the two component type developer used in Embodiment 4 are used. [[An]] The (initial) amount of the two component type developer to be used [[in]] is 210 g (in which 30 g is the carrier) for each of the developer supply containers and measurement results are shown in Figure 15.

Please amend the paragraph starting at page 25, line 20 and ending at page 26, line 3 as follows.

As shown in Figure 15, with respect to the developer supply containers having the structure as in Embodiment 1, [[a]] the remaining amount of two component type developer at the time of detection of the absence of developer was about 80 - 90 g (COMP. 4-1-1) for the developer supply container shown in Figure 9(B) and about 35 - 46 g (EMB. 4-1-2) for the developer supply container shown in Figure 9(C). On the other hand, [[a]] the remaining amount of two component type developer at the time of the absence of the developer was about 9 - 12 g (EMB. 4-1).

Please amend the paragraph starting at page 26, line 4 and ending at line 13 as follows.

Further, with respect to the developer supply containers having the structure as in Embodiment 2, [[a]] the remaining amount of two component type developer at the time of detection of the absence of developer was about 80 - 90 g (COMP. 4-2-1) for the developer supply container shown in Figure 9(B) and about 23 - 35 g (EMB. 4-2-2) for the developer supply container shown in Figure 9(C). On the other hand, [[a]] the remaining amount of two component type developer at the time of the absence of developer was about 5 - 7 g (EMB. 4-2).

Please amend the paragraph starting at page 28, line 9 and ending at line 16 as follows.

According to this embodiment, detection of the remaining amount of developer which is returned from the developer receiving container side to the developer supply container side by rotation can be efficiently made, so that it becomes possible to effect the detection at a stage such that the remaining amount of developer in the developer supply container is very small.

Please amend the paragraph starting at page 29, line 22 and ending at page 30, line 5 as follows.

In this comparative embodiment for Embodiments 5 and 6, measurement of remaining amount of developer was performed at the time of detection of the absence of developer by using a comparative developer supply container 1 shown in Figure 16(C), wherein a remaining amount detection area 20C does not overlap [[an]] a discharge perpendicular to the opening 10 as seen in a direction perpendicular to the longitudinal direction of the developer supply container 1. The measurement was also performed by using the developer supply containers shown in Figures 16(A) and 16(B).

Please amend the paragraph starting at page 30, line 7 and ending at line 9 as follows.

[[An]] <u>The</u> (initial) amount of the developer <u>to be</u> used is 180 g for each of the developer supply containers and measurement results are shown in Figure 18.

Please amend the paragraph starting at page 30, line 10 and ending at line 14 as follows.

As shown in Figure 18, the comparative developer supply container shown in Figure 16(C) had a remaining amount of developer of about 20 - 30 g (COMP. 5) at the time of detection of the absence of developer.

Please amend the paragraph starting at page 30, line 15 and ending at line 20 as follows.

On the other hand, [[a]] the remaining amount of developer at the time of detection of the absence of developer was about 3 - 4 g (EMB. 5) for the developer supply container shown in Figure 15(A) and about 6 - 10 g (EMB. 6) for the developer supply container shown in figure 16(B).

Please amend the paragraph starting at page 30, line 21 and ending at page 31, line 3 as follows.

As is apparent from the above results, according to Embodiments 5 and 6, it is possible to effect detection of the remaining amount of developer including the developer returned from the developer receiving container 4, so that the detection can be effected in such a state that the remaining amount of developer is very small. As a result, it is possible to use up the developer in the developer supply container to the extent of until a substantially empty state is reached.

Please amend the paragraph starting at page 31, line 10 and ending at line 16 as follows.

Further, in the above-described embodiments, the shape of the container body of the developer supply container of the present invention is substantially circular cylindrical but is not limited thereto. For example, it is also possible to change it into other shapes so long as it is [[a]] substantially any cylindrical shape for accommodating the developer.

Please amend the paragraph starting at page 31, line 17 and ending at page 32, line 3 as follows.

In the above described embodiments, as the feeding means, the feeding projections 12 and the pair of plate-like projections 11 are used but it is possible to use, e.g., feeding means [[14]] 214 having helical projections [111] 211 and [[112]] 212 as shown in Figure 19 showing

a modified embodiment of the present invention. As the pair of plate-like projections [[11]], it is possible to use a pair of plate-like projections each divided into plural plate-like projections as shown in Figure 20 showing a modified embodiment. Further, it is also possible to use a single helical recess or projection formed at an inner surface of the developer supply container as a modified example of the feeding means (not shown).

Please amend the paragraph starting at page 32, line 4 and ending at line 18 as follows.

In the above described embodiments, as the image forming apparatus, [[the]] a copying machine capable of forming monochromatic and full-color images is used but it is also possible to use other image forming apparatuses such as a printer, a facsimile machine, a multiple function processing machine combining these functions, and such an image forming apparatus that in which respective color toner images are successively superposed on an intermediary transfer member, such as an intermediary transfer belt or an intermediary transfer drum and are simultaneously transferred onto a transfer material. When the developer supply container of the present invention is mounted in the image forming apparatus, it is possible to achieve the above described effects.

Please amend the paragraph starting at page 32, line 19 and ending at line 25 as follows. Further, in the present invention, the number of the developing devices is not limited to four as in the above described embodiments but may be one for monochromatic color or two or more for multiple color colors or full color. The developer supply container can achieve the same effects as described above also in these cases.

Please amend the paragraph starting at page 33, line 4 and ending at line 11 as follows.

As described hereinabove, according to the present invention, it is possible to properly detect a developer remaining amount, e.g., the absence of developer even in such a state that a

remaining amount of developer in the developer supply container is very smaller small. In other words, it is possible to reduce the amount of developer remaining in the developer supply container after being used as small as possible.